FORM PTO-1390  U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE  TRANSMITTAL LETTER TO THE UNITED STATES  LP-1799
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371 \ \( \Omega \) \( \frac{762579}{} \)
INTERNATIONAL APPLICATION NO.   INTERNATIONAL FILING DATE   PRIORITY DATE CLAIMED
PCT/EP99/05757 August 9, 1999 August 11, 1998
TITLE OF INVENTION
UNSATURATED OLIGOPHENOL CYANATES
APPLICANT(S) FOR DO/EO/US
Ulrich DAUM and Alessandro FALCHETTO
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/Usane following items and other information
1. X This is a <b>FIRST</b> submission of items concerning a filing under 35 U S.C. 371
2 This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C 371. 3 This express request to begin national examination procedures (35 U.S.C 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C 371(b) and PCT Articles 22 and 39(1) 4 X A proper Demand for International Preliminary Examination was made by the 19 <sup>th</sup> month from the earliest claimed priority date
5 X A copy of the international Application as filed (35 U S C 371(c)(2)) a is submitted herewith (required only if not transmitted by the International Bureau) b x has been transmitted by the International Bureau c is not required, as the application was filed in the United States Receiving Office (RO/US)
6 A translation of the International Application into English (35 U S C 371(c)(2))
7Amendments to the claims of the International Application under PCT Article 19 (35 U S.C 371(c)(3)).  a are transmitted herewith (required only if not transmitted by the International Bureau)  b have been transmitted by the International Bureau  c have not been made; however, the time limit for making such amendments has NOT expired  d have not been made and will not be made.
8 A translation of the amendments to the claims under PCT Article 19 (35 U.S C 371(c)(3))
9. X An oath or declaration of the inventor(s) (35 U.S C 371(c)(4))
10 A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U S.C 371(c)(5))
Items 11 to 16 below concern other document(s) or information included:
11An Information Disclosure Statement under 37 C F R 1 97 and 1 98
12 X An assignment document for recording A separate cover sheet in compliance with 37 C F R 3 28 and 3 31 is included
13 X A FIRST preliminary amendment A SECOND or SUBSEQUENT preliminary amendment
14 A substitute specification.
15 A change of power of attorney and/or address letter
16Other items or information
PCT Internationaler Vorläufiger Prüfungsbericht
**Please enter the Preliminary Amendment before calculating the filing fee. **

naramera ornant

IIS Application NO /If he are	n see 37 C.F.R. 150)	TIONAL APPLICATION NO		ATTORNEY'S DOCKET NUM	ABER
O S Application NO (II know		LP-1799			
17 X The following f	ees are submitted:		1	CALCULATIONS	PTO USE ONLY
Basic Nation Search Report has	al Fee (37 C.F.R. 1.492(a)(1)-(5): been prepared by the EPO or JPO	\$	1,000.00	\$1,000.00	
International prelim	inary examination fee paid to USP	TO (37 C F R 1 482)	\$720 00		
No international pre international search	eliminary examination fee paid to U n fee paid to USPTO (37 C F.R  1.4	ISPTO (37 C F R 1 482) 445(a)(2))	but \$790 00		
Neither international search fee (37 C.F.	al preliminary examination fee (37 0 R 1.445(a)(2)) paid to USPTO	CFR 1 482) nor internat \$	ional 1070 00		
International prelim	inary examination fee paid to USP	TO (37 C F R. 1 482) and	i all \$98.00		
E	NTER APPROPRIA	TE FEE AMO	TNU	\$1,000.00	
Surcharge of \$130 0	o for furnishing the oath or declarat	tion later than 203		\$	
			Rate	<u> </u>	L
Total Claims	-20 =	Humbor Extra	X \$18 00	\$	
Independent Claims	-3 =		X \$78 00		
Multiple Dependent	Claim(s) (if applicable)		X \$270 00		
-		ABOVE CALCULATION	NS =		
Reduction by ½ for f	iling by small entity, if applicable \	Verified Small Entity state	ment		
must also be filed. (	Note 37 C.F.R 1.9, 1.27, 1.28)			·	
Processing fee of \$1	30.00 for furnishing the English tra	inslations later than 20	30		
months from the ear	liest claimed priority date (37 C.F.F				
Foo for recording the	e enclosed assignment (37 C.F.R.		_	<u> </u>	
accompanied by an appropriate cover sheet (37 C F.R. 3.28, 3 31) \$40 00 per property +				·	
		TOTAL PEES ENCEO	JLD -		Φ.
	X The bettoding fees are submitted: Search Report has been prepared by the EPO or JPO Search Report has been prepared by the EPO or JPO International preliminary examination fee paid to USPTO (37 C F R 1 482) but on the standard preliminary examination fee paid to USPTO (37 C F R 1 482) but on the standard preliminary examination fee paid to USPTO (37 C F R 1 482) but on the standard preliminary examination fee (37 C F R 1 445(a)(2)) Search fee (37 C F R 1 445(a)(2)) paid to USPTO (37 C F R 1 482) and all claims satisfied provisions of PCT 4 thele 33(c)(4)  ENTER APPROPRIATE FEE AMOUNT Uncharge of \$13.00 for furnishing the paid to USPTO (37 C F R 1 482) and all claims satisfied provisions of PCT 4 thele 33(c)(4)  ENTER APPROPRIATE FEE AMOUNT Uncharge of \$13.00 for furnishing the standard claims and the standard preliminary examination fee paid to USPTO (37 C F R 1 482) and all claims as the standard provided (37 C F R 1 482) and all claims as the standard provided (37 C F R 1 482) and all claims as the standard provided (37 C F R 1 482) and all claims as the standard provided (37 C F R 1 482) and all claims are standard provided (37 C F R 1 482) and all claims are standard provided (37 C F R 1 482) and all claims are standard provided (37 C F R 1 482) and all claims are standard provided (37 C F R 1 482) and all claims are standard provided (37 C F R 1 482) and all claims are standard provided (37 C F R 1 482) and all claims are standard provided (37 C F R 1 482) and all claims are standard provided (37 C F R 1 482) and all claims are standard provided (37 C F R 1 482) and all claims are standard provided at (37 C F R 1 482) and all claims are standard provided at (37 C F R 1 482) and all claims are standard provided at (37 C F R 1 482) and all claims are standard provided at (37 C F R 1 482) and all claims are standard provided at (37 C F R 1 482) and all claims are standard provided at (37 C F R 1 482) and all claims are standard provided at (37 C F R 1 482) and all claims are standard provided at (37 C F R 1	\$			
		,		Charged	\$
a X A check in the	amount of \$1,040.00 to cover th	ne above fees is enclosed	l.		
b Please charge	my Deposit Account No.	in the amount o	f \$	to cover the above	fees. A duplicate copy
of this sheet is	enclosed				
c X The Commiss Account No. 0	ioner is hereby authorized to charg <u>6-1110</u> . A duplicate copy of this st	e any additional fees whi neet is enclosed	ch may be	required, or credit any ove	rpayment to Deposit
NOTE ''	annua ataka kima limikaka 07.0	ED 1/9/ or 1/95 boo	not been	met a netition to revive	37 C.F.R. 1.137(a) or
(b)) must be filed a	ippropriate time limit under 37 C and granted to restore the applica	ation to pending status.	HOL DECIL	mog a position to lettre (	(a. a
		i	1:0	H Mal	
SEND ALL CORRE	SPONDENCE TO	sic	MY SNATURE	14.11000	
Suite 1401, 1725 K	Street, NW				
Trasmington, Do 2	<del>-</del>			larsh	
Tel.: 202/659-2000		N.			
February 9, 2001					
		<del>-</del> 1		N NUMBER	
Form PTO-1390 (REV 5-93)					

# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Docket: LP-1799

Applicant

DAUM, Ulrich, et al.

Serial No.

Not yet assigned

[National Stage Based Upon

PCT/EP99/05757]

Filed

February 9, 2001

For

**UNSATURATED OLIGOPHENOL CYANATES** 

## PRELIMINARY AMENDMENT

Assistant Commissioner for Patents Washington, D.C. 20231

Sir:

Please amend this application as follows:

### IN THE SPECIFICATION:

On page 1, between the title and the first line of the specification, insert the following:

-- This application is a continuation (national stage) application of International (PCT) Patent Application No. PCT/EP99/05757, filed on August 9, 1999, which is a continuing application of U.S. Provisional Application Serial No. 60/096,253, filed on August 12, 1998.--

## **REMARKS**

The continuation/continuing application history of the application has been inserted on page 1 of the application.

Respectfully submitted,

Date: Jan. 9, 2001

Virgil H. Marsh Reg. No. 23,083

Fisher, Christen & Sabol Suite 1401 1725 K Street, N.W.

Washington, D.C. 20006 Tel.: (202) 659-2000 L.P. 1799, PCT

LONZA AG, Münchensteinerstrasse 38, CH-4052 Basel

Unsaturated oligophenol cyanates

# Unsaturated oligophenol cyanates

The Invention relates to oligophenol cyanates of the general formula

$$[A-]_n[B-A-]_xB[-A]_m$$
 (I).

In this formula, A is in each case a group of the formula

and B is in each case a group of the formula

$$R^{5}$$
 $R^{5}$ 
 $R^{4}$ 

15

 $R^1$ ,  $R^2$  and  $R^3$  on each group A independently of the others are in each case hydrogen or a bond to a group B with the proviso that each group A has either one or two bonds to B.

Both  $R^4$  and  $R^{4'}$ , and  $R^5$  and  $R^{5'}$ , on each group B independently of the others, are in each case either together a direct bond or, in any desired order, are hydrogen and a bond to a group A with the proviso that each group B has either one or two bonds to A. The indices m and n are 0 or 1 and x is an integer from 0 to 10 with the proviso that at least one of the numbers m, n and x is other than 0 and m and n are not both at the same time 1.

The Invention also relates in particular to mixtures of such compounds with one another and/or with those compounds of the

10

25

10

formula I in which m and n deviate from the above definitions by both being 1.

Saturated oligophenol cyanates of general formula I in which m and n deviate from the compounds of the present invention by both being 1 are known, for example, from EP-A-0 147 548 and are marketed by the Dow Chemical Co. under the designation XU71787. These compounds do not have any olefinic double bonds and are therefore able to polymerize only by cyclotrimerization of the cyanate groups or by reaction with functional groups of other compounds. The cyclotrimerization requires the presence of catalysts and/or high temperatures. In contrast it is often desirable to achieve partial curing or crosslinking by means, for example, of irradiation at room temperature. In addition, these known compounds have a relatively high viscosity, which is unfavourable for some applications.

The object of the present invention was therefore to provide oligophenol cyanates which have a low viscosity and which without further additives can be (partially) polymerized or crosslinked at room temperature by means, for example of radiation-induced free-radical reactions.

In accordance with the invention this object is achieved by the unsaturated oligophenol cyanates of the formula I in accordance with Claim 1. The molecule of these compounds has at least one olefinic double bond  $(R^4-R^4'$  and/or  $R^5-R^5'$  according to formula I) which permits free-radical addition polymerization.

The olefinic double bonds are present in groups of the formula

30 The degree of polymerization, x, lies preferably between 0 and 5 and, with particular preference, between 0 and 3.

The unsaturated oligophenol cyanates of the invention can be prepared by reacting an oligophenol of the general formula

20

25

30

5

$$[A'-]_n[B-A'-]_xB[-A']_m$$
 (II),

in which A' is a group of the formula

$$\mathbb{R}^3$$
  $\mathbb{R}^1$ 

and B,  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^4$ ,  $R^5$ ,  $R^5$ , m, n and x are as defined in Claim 1, is reacted with cyanogen chloride in the presence of a tertiary amine. Oligophenols of formula II are obtainable from Borden Chemical Inc. under the designations ESD-X1 to -X5, ESD-472C and ESD-473C. The compounds concerned here are condensation products of dicyclopentadiene (dimeric cyclopentadiene) and phenol, which are present as a mixture of isomeric and/or homologous compounds and also contain fractions of saturated compounds where m = n = 1.

The preparation of the oligophenol cyanates of the invention is preferably carried out at a temperature of less than 10 °C in a polar solvent such as butyl acetate and/or acetone or methyl ethyl ketone, for example, or in mixtures of these solvents. Particularly preferred reaction temperatures are below 0 °C - for example, -10 °C. It is advantageous to employ 1.0-1.1 mol of tertiary amine and 1.0-1.2 mol of cyanogen chloride per OH equivalent of the oligophenol II. A particularly preferred tertiary amine is triethylamine.

The unsaturated oligophenol cyanates of the invention have a low viscosity at processing temperature and produce polytriazine resins having a particularly low dielectric constant. They are particularly suitable, for example, as matrix material for the production of fibre-reinforced composites, especially for

components in aerospace technology, or as base materials for the production of printed circuit boards. Owing to their low viscosity and capacity for polymerization by means of high-energy radiation (UV, X-rays,  $\gamma$ -rays or electron beams), they are also suitable for (photo)lithographic varnishes, solder resists for circuit boards, or other radiation-curable lacquers and coatings.

The following example illustrates the preparation of the oligophenol cyanates of the invention without constituting any restriction.

### Example

Oligophenol ESD-X3 (Borden Chemical Inc.) was dissolved in n-butyl acetate/acetone (v/v = 80:20) to give a 15% strength solution. The solution was cooled to -10 °C and, at this temperature, 105% of the calculated amount of triethylamine and then, over the course of 30 minutes, 110% of the calculated amount of cyanogen chloride were added. After a further 30 minutes of reaction, the mixture was subjected to extraction with water, twice at 30 °C, in order to remove the ammonium salts formed, and was then passed twice through a falling-film evaporator in order to remove the solvent and the by-product, N, N-diethylcyanamide.

Yield: about 100%

25 Properties:

viscosity: 165 mPa·s (at 125°C)

degree of reaction: (phenol → cyanate) >98%

gel time: 25 min (at 200°C)

carbamates: <1%

30 N, N-diethylcyanamide: <2000 ppm

20

25

#### Claims

1. Unsaturated oligophenol cyanates of the formula

5 
$$[A-]_n[B-A-]_xB[-A]_m$$
 (I),

in which A is in each case a group of the formula

and B is in each case a group of the formula

wherein  $R^1$ ,  $R^2$  and  $R^3$  are in each case hydrogen or a bond to a group B with the proviso that each group A has either one or two bonds to B;

both  $R^4$  and  $R^4$ , and  $R^5$  and  $R^5$  are in each case either together a direct bond or are hydrogen and a bond to a group A with the proviso that each group B has either one or two bonds to A; the indices m and n are 0 or 1 and x is an integer from 0 to 10 with the proviso that at least one of the numbers m, n and x is other than 0 and x and x are not both at the same time 1, and mixtures thereof with one another and/or with those compounds of the formula I in which x and x deviate from the above definitions by both being 1.

5

- 2. Oligophenol cyanates according to Claim 1, characterized in that x is from 0 to 5.
- 3. Process for preparing unsaturated oligophenol cyanates according to Claim 1, characterized in that an oligophenol of the general formula

$$[A'-]_n[B-A'-]_xB[-A']_m$$
 (II),

in which A' is a group of the formula

$$R^3$$
 $R^1$ 
 $R^2$ 

and B,  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^4$ ,  $R^5$ ,  $R^5$ , m, n and x are as defined in Claim 1, is reacted with cyanogen chloride in the presence of a tertiary amine.

- 4. Use of the unsaturated oligophenol cyanates according to Claim 1 as matrix material for fibre-reinforced composites.
- 5. Use of the unsaturated oligophenol cyanates according to Claim 1 as radiation-curable varnishes, resists, lacquers and coatings.

25

#### Abstract

5

The invention relates to unsaturated oligophenol cyanates of the general formula (I)  $[A-]_n[B-A-]_xB[-A]_m$  in which A is a group of formula

and B is a group of formula

$$R^{5}$$
 $R^{4}$ 
 $R^{4}$ 
 $R^{5}$ 

where  $R^1$ ,  $R^2$  and  $R^3$  are each hydrogen or a bond with a group B, there being either one or two bonds with B; and both  $R^4$  and  $R^4$  as well as  $R^5$  and  $R^5$  separately or jointly represent a direct bond or hydrogen and a bond with a group A, there being either one or two bonds with A. The indices m and n are 0 or 1 but not both 1 at the same time and x is a whole number between 0 and 10, where at least one of the numbers m, n and x is not 0.

The above unsaturated oligophenol cyanates can be prepared by reacting the corresponding oligophenols with cyanogen chloride. They have a low viscosity and owing to their double bonds are able to undergo free-radical polymerization. They are especially suitable for use as matrix materials for fibre-reinforced composites and for radiation-curable varnishes and coatings.

0010/PTO	U.S. Department of Con	nmerce		
Rev 6/95	Patent and Trademark (	First Named Inventor DAUM  COMPLETE IF KNOWN  Application Number  Filling Date  Submitted After Initial Filling  Group Art Unit  Examiner Name  circumptor (if only one name is listed below) or an original, first and joint inventor (if plural names which is claimed and for which a patent is sought on the invention entitled.  GOPHENOL CYANATES  (Title of the Invention)  as United States Application Number or PCT International and was amended on (MM/DD/YYYY) (if applicable)  understand the contents of the above identified specification, including the claims, as amended by an international application which is maternal to patentability as defined in Title 37 Code of Federal Regulations, § .56.  ander Title 35, United States Code §119 (a)-(d) or §365(b) of any foreign application(s) for patent or innational application which designated at least one country other than the United States of America, in the box, any foreign application for patent or inventor's certificate, or of any PCT international application on which priority is claimed  Priority Not Claimed  Copy Attactive (MM/DD/YYYY) Priority Not Claimed  Copy Attactive (MM/DD/YYY	LP-1799	
			DAUM	
DE	First Named Inventor DAUM  COMPLETE IF KNOWN  Application Number  Filing Date  Submitted After Initial Filing  Initial Filing  Proup Art Unit  Examiner Name  Ventor, I hereby declare that:  "fice address, and citizenship are as stated below next to my name initial, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names is subject matter which is claimed and for which a patent is sought on the invention entitled.  ATED OLIGOPHENOL CYANATES  ATED OLIGOPHENOL CYANATES  (Title of the Invention)  Indicate the Invention on (MM/DD/YYYY)  As United States Application Number or PCT International Application on (MM/DD/YYYY)  Are reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment or above.  In priority benefits under Title 35, United States Code §119 (a)-(d) or §365(b) of any foreign application(s) for patent or inventor's or of any PCT international application having a of the application on which priority is claimed  Eventor, I hereby declare that:  Filing Date  Filin			
DECLARATION  DECLARATION  Declaration OR Declaration Submitted After Initial Filing Initial Filing  s a below named inventor, I hereby declare that:  Ity residence, post office address, and citizenship are as stated below believe I am the original, first and sole inventor (if only one name is realisted below) of the subject matter which is claimed and for which Initial Filing  UNSATURATED OLIGOPHENOL CY  The specification of which Its attached hereto  OR Was filed on (MM/DD/YYYY)  Tumber and was amended or thereby state that I have reviewed and understand the contents of the pecifically referred to above.		Application Number		
A	1		Filing Date	
			Group Art Unit	
a below named inventor, I hereby declare that: residence, post office address, and citizenship are as stated below elieve I am the original, first and sole inventor (if only one name is li		Examiner Name		
s a below named inventor, I	hereby declare that:			
y residence, post office add	iress, and citizenship are a	s stated below next to my	name	
				dural names
				nurai mames
		01.00/4414.		
UNSATURATE	D OLIGOPHEN	OL CYANATES	5	
ne specification of which	(Title of t	he Invention)		
·				
is attached hereto	0			
<b>○</b> □				
	/DD/YYYY)		as United States Application Number or	PCT International Application
was filed on (MM/		amended on (MM/DD/YY)		• •
was filed on (MM/	and was	·	Y) (if	applicable)
was filed on (MM/	and was	·	Y) (if	applicable)
was filed on (MM/	and was lewed and understand the c	contents of the above iden	(if a specification, including the claims,	applicable) as amended by any amendm
was filed on (MM/	and was lewed and understand the c	contents of the above iden	(if a specification, including the claims,	applicable) as amended by any amendm
was filed on (MM/	and was lewed and understand the control of the con	material to patentability as	(if a specification, including the claims, defined in Title 37 Code of Federal Reg	applicable) as amended by any amendm ulations, § .56.
was filed on (MM/ lumber hereby state that I have revipecifically referred to above. acknowledge the duty to dis hereby claim foreign priority sertificate, or §365(a) of any lave also identified below, by	and was lewed and understand the of the colors information which is the colors in the color benefits under Title 35, Un PCT international application of the colors of the	material to patentability as inted States Code §119 (a) on which designated at lea	(if a specification, including the claims, defined in Title 37 Code of Federal Regulation (d) or §365(b) of any foreign application and country other than the United States.	applicable)  as amended by any amendm  ulations, § .56.  n(s) for patent or inventor's tes of America, listed below a
was filed on (MM// lumber hereby state that I have revipedifically referred to above. acknowledge the duty to dishereby claim foreign priority ertificate, or §365(a) of any lave also identified below, by	and was lewed and understand the of the colors information which is the colors in the color benefits under Title 35, Un PCT international application of the colors of the	material to patentability as inted States Code §119 (a) on which designated at lea	(if a specification, including the claims, defined in Title 37 Code of Federal Regulation (d) or §365(b) of any foreign application and country other than the United States.	applicable)  as amended by any amendm  ulations, § .56.  n(s) for patent or inventor's tes of America, listed below a
was filed on (MM/ umber  hereby state that I have revipecifically referred to above.  acknowledge the duty to dis hereby claim foreign priority ertificate, or §365(a) of any lave also identified below, by ling date before that of the a  Prior Foreign Application	and was newed and understand the objective information which is the benefits under Title 35, Un PCT international application of the box, any foreign policities on which priority	material to patentability as inted States Code §119 (a) on which designated at lea eign application for patent is claimed	(if a specification, including the claims, defined in Title 37 Code of Federal Regular (d) or §365(b) of any foreign application at one country other than the United Steps inventor's certificate, or of any PCT in	applicable) as amended by any amendm ulations, § .56. n(s) for patent or inventor's ites of America, listed below a iternational application having
was filed on (MM/ lumber  hereby state that I have revi pecifically referred to above. acknowledge the duty to dis hereby claim foreign priority ertificate, or §335(a) of any I guide and a series of the acceptance of the accepta	and was newed and understand the control of the con	material to patentability as ited States Code §119 (a) on which designated at leaging application for patent is claimed  Foreign Filing Date (MM/DD/YYYY)	(if a specification, including the claims, defined in Title 37 Code of Federal Regret(d) or §365(b) of any foreign application st one country other than the United State or inventor's certificate, or of any PCT in Priority Not Claimed	applicable) as amended by any amendm ulations, § .56. n(s) for patent or inventor's ites of America, listed below a termational application having  Copy Attached? YES NO
was filed on (MM/ lumber  hereby state that I have revipedifically referred to above. acknowledge the duty to dis hereby claim foreign priority retificate, or §365(a) of any I ave also identified below, by ling date before that of the a  Prior Foreign Application Number(s)  PCT/EP99/09477	and was newed and understand the objective information which is a benefits under Title 35, Un PCT international application of the box, any for application on which priority Country  International	material to patentability as inted States Code §119 (a) on which designated at leading application for patent is claimed  Foreign Filing Date (MM/DD/YYYY)  08/09/1999	(if strings) (if s	applicable) as amended by any amendm ulations, § .56. a(s) for patent or inventor's ites of America, listed below a sternational application having  Copy Attached? YES NO
was filed on (MM/ lumber  hereby state that I have revipedifically referred to above. acknowledge the duty to dis hereby claim foreign priority retificate, or §365(a) of any I ave also identified below, by ling date before that of the a  Prior Foreign Application Number(s)  PCT/EP99/09477	and was newed and understand the control of the con	material to patentability as inted States Code §119 (a) on which designated at leading application for patent is claimed  Foreign Filing Date (MM/DD/YYYY)  08/09/1999	(if a specification, including the claims, defined in Title 37 Code of Federal Regreton (d) or §365(b) of any foreign application in the country other than the United State or inventor's certificate, or of any PCT in Priority Not Claimed	applicable) as amended by any amendm ulations, § .56.  (s) for patent or inventor's tes of America, listed below a sternational application having  Copy Attached? YES NO  X   X
was filed on (MM/ lumber  hereby state that I have revipeoifically referred to above.  acknowledge the duty to dis hereby claim foreign priority retrificate, or §365(a) of any liave also identified below, by ling date before that of the a  Prior Foreign Application	and was newed and understand the control of the con	material to patentability as inted States Code §119 (a) on which designated at leaging application for patent is claimed  Foreign Filing Date (MM/DD/YYYY)  08/09/1999  08/11/1998	(if a specification, including the claims, defined in Title 37 Code of Federal Regressed on Section 24 of Section 25 on Section 26 on Section 27 of Section 27 on Section 27 on Section 28 on Section 28 on Section 29 on Section	applicable) as amended by any amendmulations, § .56.  Its of patent or inventor's interest of America, listed below a sternational application having YES NO  IX
was filed on (MM/ lumber  hereby state that I have revipecifically referred to above. acknowledge the duty to dis hereby claim foreign priority ertificate, or §365(a) of any I ave also identified below, by ling date before that of the a  Prior Foreign Application Number(s)  PCT/EP99/09477	and was newed and understand the control of the con	material to patentability as inted States Code §119 (a) on which designated at leaging application for patent is claimed  Foreign Filing Date (MM/DD/YYYY)  08/09/1999  08/11/1998	(if a specification, including the claims, defined in Title 37 Code of Federal Regressed on Section 24 of Section 25 on Section 26 on Section 27 of Section 27 on Section 27 on Section 28 on Section 28 on Section 29 on Section	applicable) as amended by any amendmulations, § .56.  Its of patent or inventor's interest of America, listed below a sternational application having YES NO  IX

Filing Date (MM/DD/YYYY)

Application Number(s)

Additional provisional application numbers are listed on a supplemental priority sheet attached hereto.

1.5
T.
U
7n <sub>en</sub>
112
11000
31
ii.
The state of the s
The state of the s
A truly then the

DECLARATION	Page 2
· · · · · · · · · · · · · · · · · · ·	·

I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s), or §365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code §112, I acknowledge the duty to disclose information which is maternal to patentability as defined in Title 37, Code of Federal Regulations 1 56 which became available between the filing date of the prior application and the national or PCT filing date of this application

PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
PCT/EP99/05757	08/09/1999 08/12/1998	
	Number	Number (MM/DD/YYYY) 08/09/1999

As a named inventor, I hereby appoint Trademark Office connected therewith	he following attorney(s) and/or agent(s) t	o prosecute this application and to transa	act all business in the Patent and
Firm Name Fisher, Chr	isten & Sabol	Payor Number (if applicable)	
Name	Registration Number	Name	Registration Number
Virgil H. Marsh	23,083_		
Kara M. Armstrong	38,234		
Additional attorney(s)	and/or agent(s) named on a supplem	nental sheet attached hereto	

X Please direct all correspondence to	Name	Virgil H. Marsh	
Address Fisher, Christen & S	Sabol		
Address Suite 1401, 1725 K	Street, I	N.W.	
city Washington		State D.C.	zip 20006
country USA		Telephone (202)659-2000	Fax (202)659-2015
	on of my own	Telephone (202)659-2000	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or improsonment, or both, under Section 1001 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent using the coordinate of the coor any patent issued thereon

Switzerland

- B	Given Name	Ulrich
	Inventor's Signature	Mind
	Residence:	Hofstetten

Hofstetten

City

A petition has been filed for this unsigned inventor

Family Name 01/26/01 Garman (#X Suffix DAUM

City Chöpfliweg 17 Post Office Address:

Name of Sole or First Inventor:

CH-4114

Country Applicant Authority Switzerland

Citizenship

X

Additional inventors are being named on supplemental sheet(s) attached hereto

Middle Initial

Postal Code



	s sign (+) inside thi DECLARAT						INVENTOR	k(S
					S	uppleme	ntal Sheet	
Name of Ac	lditional Joint Inve	ntor, if	any:		petition has b	een filed for this ur	nsigned inventor	
Given Ale		Middle nitial <b>\</b>		Family Name	FALC	HETTO	Suffix	
inventor's	10	0	1 1/2	N	*7-		Date	
Signature	H bushilles	<u> </u>	<u>ULB</u>	W	•		31,01,01	
Residence: Do	modossola	}	Country	Italy			Citizenship	tal
Post Office Addres	s: Via Leopardi	2/c						
City Domo	dossola	Pos		8845	Country	Italy	Applicar Authorit	
Name of Ac	ditional Joint Inve			ТП	natitas bas b	een filed for this ur	· · · · · · · · · · · · · · · · · · ·	<u>y</u> L
Given		Middle	1	Family	r petition has b	sen med for this ur	Suffix	
Name Inventor's		nitial		Name			Date	ļ
Signature							Date	
Residence:			Country				Citizenship	
City   Post Office Addres	ss:			I				Ь
City		Pos	tal		Country	l	Applicar	at
Name of As	Iditional Joint Invo	Cod					Authorit	<u>y  </u>
	Iditional Joint Inve		any.		petition has b	een filed for this ui	*	
Gîven Name		Middle nitial		Family Name			Suffix	
Inventor's Signature				'	<del>  </del>		Date	
Residence:			Country	ı			Citizenship	ļ
City Post Office Addres	<del></del>		Country					<u> </u>
	···	1 5	4-1		Lower	T	l Ameliain	4 1
City		Pos Cod	le		Country		Applicar Authorit	
Name of Ac	Iditional Joint Inve	ntor, if	any:		petition has b	een filed for this ui	nsigned inventor	
Given Name		Middle nitial	T	Family Name	T		Suffix	
Inventor's		inuai		ivaine		<del></del>	Date	
Signature	. =							
Residence: City			Country				Citizenship	
Post Office Addre	ss:							
City		Pos			Country		Applicar Authorit	
Name of A	iditional Joint Inve				A petition has b	een filed for this u	•	<u>,                                     </u>
Given		Middle		Family	1		Suffix	1
Name Inventor's		Initial		Name			Date	-
Signature								
Residence: City			Country				Citizenship	
Post Office Addre	ss:	1		I			1	1
City		Pos			Country	1	Applicar	
	Iditional Joint Inve	ntor if		T -		1	Authorit	<u>y  </u>
Name of Δε			~··y·		A petition has b	een filed for this u	- T	
			1	Family			Suffix	L
Given Name		Middle Initial		Name				
Given			ļ	Name			Date	
Given Name Inventor's Signature			Country	Name				
Given Name Inventor's Signature  Residence: City			Country	Name	_ I		Date Citizenship	
Given Name Inventor's Signature  Residence:				Name	Country			<u> </u>

ITX